We Claim

1. A composition which comprises

(1) a matrix material; and

(2) distributed in the matrix material, or adjacent to the matrix material, a modifying agent which

(a) comprises

(i) a polymeric ingredient which comprises a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and

(ii) an active chemical ingredient which, when in contact with a matrix material under selected conditions, promotes or inhibits a chemical reaction of the matrix material, and

(b) is in the form of a solid which, when exposed to a change in a variable selected from temperature, concentration of a solvent, electromagnetic radiation, ultrasonic radiation, and pH, undergoes a physical change which causes the modifying agent to lose its physical integrity and increases the extent to which the matrix material is contacted by the active chemical ingredient, said solid formbeing selected from

(i) solid particles which are distributed in the matrix material, and which have one or more of the following characteristics

(a) an average particle size of 0.1 to 150 microns,

(b) a polymeric ingredient having a heat of fusion of at least 20 J/g, and

(c) a polymeric ingredient in which the crystalline polymeric moiety is a side chain crystalline polymer, and

(ii) a film which is in contact with the matrix material.

2. A method of making a chemical compound which comprises

(A) subjecting a composition as defined in claim 1 to a said change in a variable; and

(B) simultaneously with step (A), or after step (A), subjecting the matrix material and the modifying agent in contact therewith to conditions which cause a chemical reaction of the matrix material.

3. A temperature-sensitive modifying agent which

(a) comprises

(i) a polymeric ingredient which comprises a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and

(ii) an active chemical ingredient which, when in contact with a matrix material under selected conditions, promotes or inhibits a chemical reaction of the matrix material, and

(b) is in the form of a solid which, when exposed to a change in a variable selected from temperature, concentration of a solvent, electromagnetic radiation, ultrasonic radiation, and pH, undergoes a physical change which causes the modifying agent to lose its physical integrity and increases the extent to which the matrix material is contacted by the active chemical ingredient, and

(c) has one or both of the following characteristics

(1) the active chemical ingredient is chemically bonded to the polymeric ingredient and is a catalytic moiety comprising a metal or an enzyme, and

(2) the crystalline polymeric ingredient has a heat of fusion of at least 20 J/g and/or is a side chain crystalline polymeric moiety, and the modifying agent is in the form of particles having an average diameter of 0.1 to 150 microns.

4. A method of making a temperature-sensitive modifying agent which comprises

(i) a polymeric moiety which comprises a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$; and

(ii) a catalytic moiety which is bonded to the polymeric moiety through a bond having a strength of at least 10 Kcal/mole;

said method comprising

(I) copolymerizing

(a) a first monomeric component which comprises one or more monomers which can be polymerized to form a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and

(b) a second monomeric component which can be copolymerized with the first component and which comprises one or more monomers containing an active chemical moiety which (i) does not react during the copolymerization and (ii) contains a metal or an enzyme and can catalyze a reaction of a matrix;

(II) (A) providing a polymer which comprises

(i) a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and

(ii) at least one reactive group P; and

(B) reacting the polymer provided in step (A) with a component which contains at least one reactive group T which will react with the group P and at least one active chemical moiety which (i) does not react during the reaction and (ii) contains a metal or an enzyme and can catalyze a reaction of a matrix; or

(III)

(A) providing a polymer which contains at least one reactive group Q and a plurality of catalytic moieties which contain a metal or an enzyme and can catalyze a reaction of a matrix, and

(B) reacting the polymer provided in step A with a component which (i) contains at least one reactive group V which will react with the group Q and (ii) after the reaction, provides a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $Tp^{0.7}$; or

(IV)

(A) providing a polymer which contains a plurality of reactive groups R, which may be the same or different, and

(B) reacting the polymer provided in step A with a first component which (1) contains at least one reactive group W which will react with the group R and (ii) after the reaction, provides a crystalline polymeric

moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and with a second component which contains at least one reactive group X which will react with the group R and at least one active chemical moiety which (i) does not react during the reaction and (ii) contain a metal or an enzyme and can catalyze a reaction of a matrix.

5. A method of making a temperature-sensitive modifying agent which

(a) comprises

(i) a polymeric ingredient which comprises a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and

(ii) an active chemical ingredient which, when in contact with a matrix material under selected conditions, promotes or inhibits a chemical reaction of the matrix material, and

(b) is in the form of a solid which, when exposed to a change in a variable selected from temperature, concentration of a solvent, electromagnetic radiation, ultrasonic radiation, and pH, undergoes a physical change which causes the modifying agent to lose its physical integrity and increases the extent to which the matrix material is contacted by the active chemical ingredient,

said polymeric ingredient having a heat of fusion of at least 20 J/g and/or containing a side chain crystalline polymeric moiety, which method comprises forming the modifying agent into particles having an average diameter of 0.1 to 150 microns; or

(A) forming the active chemical ingredient into particles having an average diameter of 0.1 to 150 microns, and

(B) forming the polymeric ingredient into a coating around the particles prepared in step (A).

6. A copolymer which comprises

(A) first polymeric blocks which comprise a polymeric moiety comprising a crystalline polymeric moiety having an onset of melting temperature T_o and a peak melting temperature T_p such that $T_p - T_o$ is less than $T_p^{0.7}$, and

(B) second polymeric blocks which are different from the first polymeric blocks,

the copolymer having at least one of the following characteristics

(1) the first polymeric blocks are derived from a modifying agent as defined in claim 3;

(2) the crystalline polymeric moiety in the first polymeric blocks has a heat of fusion of at least 20 J/g and/or is a side chain crystalline polymeric moiety, and the copolymer is in the form of a foam, an electrically insulating coating on a conductor, a coating on a printed circuit board, a resist on a substrate which is to be plated or etched, an epoxy graphite composite, or a powder coating; and

(3) the crystalline polymeric moiety in the first polymeric blocks has a heat of fusion of at least 20 J/g and/or is a side chain crystalline polymeric moiety, and the polymer is crosslinked, preferably thermoset so that it does not flow when heated; and

7. A product which comprises

(A) a first polymer which is a side chain crystalline polymer having an onset of melting temperature T_o and a peak melting temperature T_p such that T_p-T_o is less than $T_p^{0.7}$, and

(B) a second polymer which is different from the first polymer, which is thermoset so that it does not flow when heated, and which provides a continuous phase in which the first polymer is distributed.

8. A composition according to claim 1 which also contains a coadditive which contains (i) one or more non-polar groups which are alkyl, fluoroalkyl, or alkyl styrene groups in wh ich the alkyl groups contain at least 6 carbon atoms, and (ii) one or more polar groups which are epoxy, hydroxyl, carboxyl, amino, ammonium, ether, ester, amide, sulfonamide, sulfonic acid, sulfonic acid salt or phosphate groups.

9. A composition according to claim 1 wherein the modifying agent contains polar groups and the matrix material contains polar groups.